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The creation of feedback in training as a mobilizing factor for the cognitive activity of students


La creación de capacitación reactiva como un factor movilizador para la actividad cognitiva de los estudiantes

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Abstract

The article examines the relationship between cognitive activity and creation of feedback in learning. The study was conducted on 120 students of Baku State University. Experimental and control groups were selected in the research and carried out in two stages. During the research, modern teaching methods and other techniques were used to increase cognitive activity. A comparative analysis of the first and second stages showed that the relationship between increased cognitive activity and the feedback mechanism is bilateral. That is, the creation of feedback increases cognitive activity, increasing cognitive activity inevitably creates a feedback mechanism. The research has shown that there is a correlation between learning achievements ($r = 0.29$), self-realization ($r = 0.33$), self-assessment ($r = 0.25$), learning motivation ($r = 0.35$) and cognitive activity in the experimental group. The study concludes that high academic performance is associated with the desire to achieve the highest results, develop potential and increase self-esteem through academic achievement. The study concludes that the desire to develop the potential, to achieve the highest results with high academic performance and to increase self-esteem through academic achievement are interconnected. It is the feedback mechanism that can act as a condition for enhancing learning achievements.

Keywords: learning, feedback, cognitive activity, self-realization, students.

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Resumen

El artículo examina la relación entre la actividad cognitiva y la creación de retroalimentación en el aprendizaje. El estudio se realizó en 120 estudiantes de la Universidad Estatal de Bakú. Se seleccionaron grupos experimentales y de control en la investigación y se llevaron a cabo en dos etapas. Durante la investigación, se utilizaron métodos de enseñanza modernos y otras técnicas para aumentar la actividad cognitiva. Un análisis comparativo de la primera y segunda etapa mostró que la relación entre el aumento de la actividad cognitiva y el mecanismo de retroalimentación es bilateral. Es decir, la creación de retroalimentación aumenta la actividad cognitiva, el aumento de la actividad cognitiva inevitablemente crea un mecanismo de retroalimentación. La investigación ha demostrado que existe una correlación entre los logros de aprendizaje ($r = 0.29$), la autorrealización ($r = 0.33$), la autoevaluación ($r = 0.25$), la motivación de aprendizaje ($r = 0.35$) y la actividad cognitiva en el grupo experimental. El estudio concluye que el alto rendimiento académico está asociado con el deseo de lograr los mejores resultados, desarrollar el potencial y aumentar la autoestima a través del rendimiento académico. El estudio concluye que el deseo de desarrollar el potencial, lograr los mejores resultados con un alto rendimiento académico y aumentar la autoestima a través del rendimiento académico están interconectados. Es el mecanismo de retroalimentación que puede actuar como una condición para mejorar los logros de aprendizaje.

Palabras clave: aprendizaje, retroalimentación, actividad cognitiva, autorrealización, estudiantes.

Introduction

In modern times, various ways and means are used to increase the effectiveness of learning activities and the formation of a creative personality. The main task is to ensure the formation of students as individuals, to increase their cognitive activity during the reform and to motivate them to succeed in training. Education changes with society, and it is part of society. What happens in society manifests itself primarily in education. Therefore, any changes in education, including the requirements of society, social orders must be taken into account during the reform. In this regard, the feedback mechanism not only increases cognitive activity, but also increases the effectiveness of the formation of the business personality required by society.

At the same time, the variability of the modern world leads to the emergence of problems that do not meet the standards from time to time, and the subjects of education face problems that do not exist in previous practice. This time, students are faced with various and complex requirements that do not match their experience and cognitive abilities, and require maximum mobilization to solve problem situations. In order to solve such issues or problems, it is necessary to establish a feedback system that provides cognitive activity in educational subjects and creates

new knowledge, skills and habits in them. Due to the incorrect regulation of cognitive activity, students have difficulty in understanding themselves and the given material. This difficulty can manifest itself in his future educational success and in the realization of the potential of an individual. That must be taken into account that cognitive activity is a complex psychological process. Due to cognitive activity, an individual achieves success, determines his abilities and place in society. If the results obtained by the student due to cognitive activity do not create a basis for his social development, his confidence in his inner potential does not increase, but rather creates self-doubt.

Increasing cognitive activity is not only due to the developmental nature of the learning materials, the creation of problem-situations and the use of other unusual methods. It is also possible due to the creation of a feedback mechanism. The creation of a feedback mechanism in the training activity leads to the increase, direction and optimal manifestation of cognitive activity. They are interdependent with each other, the implementation of one stimulates the other.

Establishment of feedback mechanism in learning includes taking into account the optimistic beginning of lesson, creation of subject-subject relationships in teacher-student relationships, reducing the emotional tension, on the contrary, increase of intellectual tension, formation of favorable educational environment, individual-psychological features, cognitive abilities.

Researchers Alizade (1998); Aliyev and Jabbarov (2008) and daily observations of learning activities show that students suffer more from the lack of feedback mechanism. The academic teaching of the lesson, the teacher's deep professional qualities, as well as the provision of the necessary knowledge in the lesson do not ensure the success of the learning, and most importantly, weaken the necessary motivation. Students expect more teachers to appreciate their work and establish business contacts with them. If such a situation does not arise, the student studies only for the sake of marks and often cannot find himself in the profession. Because he cannot imagine himself in the context of relationships as an individual, as an integral part of learning activities. All this makes it important to find more acceptable methods to create feedback in training, to focus on students' cognitive activity as a mobilizing factor.

Description of research

Research on the study of the feedback mechanism are very diverse. The first researches were aimed at studying the interaction and influence of "Me with the Mirror" with the surrounding reality as a feedback mechanism. These studies have found a significant and high correlation between self-perception and the evaluation of others (Robert B. Burns, 1986). In the learning process, the student's perception of himself directly depends on the teacher's assessment of him (not on the value given to knowledge, but on the value given to his personality, skills, self-expression). The consistency of the teacher's assessment with the assessment of personal values increases the student's self-confidence as well as cognitive activity. However, it is not possible to suggest that there is an indirect relationship between self-esteem and the feedback mechanism of others, especially the teacher's opinion, and that this relationship often arises spontaneously. In fact, this is not the case. Because feedback is dynamic and cannot be accepted unequivocally.

Brindley and Scoffield (1998), obtained interesting results in their study:

Expert evaluation was included in the evaluation strategy of two marketing modules for two undergraduate programs at the University of Manchester. The questionnaire was used to obtain answers from a sample of 80 students regarding their relationship to peer experience and his experience. The students felt that the advantages of peer evaluation were: increased personal motivation as a result of their active participation in the evaluation process; the opportunity to compare and discuss the assignment, as well as the opportunity to gain knowledge and develop a better understanding of the contents of the assignment and the assessment process. Criticism included the impact of personal bias on grades, interpretation of criteria, and student ability to evaluate. Some students viewed peer assessment as an incentive to fulfill, while others viewed it as an unfair system that lacked objectivity. More than half of the sample regarded the assessment as an exclusively role for the tutor. The study showed that peer assessment made a valuable contribution to the variety of grades, and this allowed students to better understand the grading process, but it was a laborious process for educators" (Brindley & Scoffield, 1998, p.79).

Research has shown that norms of social behavior are strongly varied in different subcultures and situations. Excessively open assessments, especially negative assessments, are not appreciated. Analyzing numerous studies, Bloomberg found that messages given from strangers are not appreciated and are these messages are not answered. If the assessment is negative, it is not accepted, even if it is by the person's relatives (Bloomberg, 1972). It can be concluded that not only learning activities, but also the feedback mechanism in the system of relations is characterized by appreciation in intersubject relations. Therefore, the use of positive directional assessment in the learning process during the establishment of feedback creates the basis for the activation of this mechanism.

Although the issue of increasing the cognitive activity of the feedback mechanism in training, it has been widely reflected in indirect research, although not directly. Feedback in learning increases the cognitive activity not only of students, but also of those who evaluate them, creates the basis to the development of critical thinking (Topping & Ehly, 2001). However, the feedback mechanism enhances the optimality of learning by enhancing the critical thinking skills of the evaluators and providing timely feedback to the evaluators. This increases the time spent delivering thinking, comparing, contrasting, and learning tasks (Topping et al., 2000). In addition, feedback prevents the assessment of wrong knowledge, simplifies generalization, identifies missing knowledge, and prevents deviations from the ideal. Students can learn not only from the peer feedback itself, but through meta-processes such as reflecting on and justifying what they have done. However, do academics subscribe to the viewpoint that they have a major responsibility in developing these lifelong learning skills? This is a key tension.

If teaching and learning cultures emphasize individual achievement to the detriment of more collaborative approaches, the potential of peer feedback for learning may not be fully realized. High-quality implementation of the feedback mechanism by evaluators allows to achieve better results in learning (Liu, et al., 2006) A study of the process of assessing the performance or knowledge of individual students by teachers before the overall assessment in learning activities shows that those who give more detailed and constructive comments work better than those who give fewer comments, and that learning tasks are more successful. A number of studies have shown that the requirements involved in the process of implementation of the feedback mechanism work harder than others about extra assignments that are not required in addition to the lesson. In addition to increasing cognitive activity, it also increases learning motivation, creating continuous and stable learning motives (Topping et al., 2000).

Olson (1990) found that students achieve better results when they receive high marks from both peers and teachers. Some students do not trust their peers' assessments. This creates self-doubt and low valuation in them. Therefore, the attempt of teachers to successfully organize the communication process during the creation of the feedback mechanism cannot lead to the desired result. Students themselves must adequately evaluate each other and support each other in the process of mutual communication.

Brindley and Scoffield (1998) state that some students express their concern about the objectivity of research regarding the possibility of individual bias when opinions are given by

peers. Some students think that teachers have the sole responsibility to form the right attitude. They believe that their peers or group mates are biased towards their activities (Brindley & Scoffield 1998; Liu & Carless 2006; Wen & Tsai 2006).

Interest plays an important role in activating the mobilizing aspects of cognitive activity through the feedback mechanism. It is important to establish a feedback mechanism as a factor. Research with younger students has shown that persistent academic achievement of elementary school students may be due to fairly good Home environment and Interest of the students in the studies. Therefore, there is a hope that with the improvement in the available facilities like free books, uniform, educational counselling and midday meal particularly to the girl students will bring qualitatively changes in their academic (Meenu, 2016). Research shows that interest plays an important role in psychology. Its special interest and significance in psychology stems from its relation to personality, motivation, cognitive activity, development, occupation, behavior, reasoning, and information processing. The stimulation of interest during the feedback in learning process is necessary condition. In this case, regardless of the choice of feedback method, cognitive processes in students become more active, the given material is better understood, emotions join the process and enrich it, metacognitive strategies are activated (Meenu, 2016).

In order to increase cognitive activity in students, feedback mechanism should go in two directions. The first of them is directed from teacher to students, the other is from students to teacher. In fact, in traditional and modern education, the feedback mechanism created by the teacher's efforts is more appreciated and is considered to be a more perfect position in activating cognitive processes, creativity and learning motivation. However, group work is necessary for this process to take place. It is in the group activity that the feedback mechanism works more quickly and optimally. When this is the case, learning habits become more perfect, and it is easier for students to take on certain responsibilities.

Studies show that the literature on external feedback is not developed in terms of how teachers should formulate feedback comments, what type of discourse should be used, how many comments are appropriate and in what context they should be made. Much more research is required in this area (Nicol & Macfarlane-Dick, 2006, p.179).

Furthermore, these studies have shown that if students receive feedback consistently and regularly, it will produce better monitoring of student progress. Similarly, other strategies that improve the quality of teacher feedback based on previous concepts and research works present:

(i) Affirm the proportion of feedback in relation to predefined criteria but paying attention to the number of criteria by Nicol and Macfarlane -Dick; (ii) timely feedback: this means that, before it is too late for students to change their work, rather than alone, as the research literature suggests, soon after the presentation; (iii) provide amending advice, not just identify information on strengths / weaknesses; (iv) limit the amount of feedback that is really useful; (v) prioritize the areas that show improvement; (vi) offer tests for the purpose of accessing the comments in a fully available way and whenever the students wish. In other words, the learning activities mentioned in this process lead to the development of student self-regulation, not only cognitive processes, but also personality qualities develop. The established feedback mechanism in itself forms the process of self-regulation. This leads to a decrease in emotional tension and barriers, and creates the basis for a dynamic change in activity in educational practice. The student understands the essence of the learning process and himself, takes care of the development of identity and skills. Also, the student's attitude to the educational process changes from a negative to a positive direction. (Zimmerman, 2002, pp. 65-66). Such a behavioral strategy raises the level of understanding of the student's learning activities, creates the basis for the formation of skills that allow him to analyze the stages, creates the ability to regulate and manage their own actions. In other words, the creation of a feedback mechanism builds interaction with metacognitive skills and self-regulatory skills. It ensures their interdependence. It should be borne in mind that the creation of a feedback mechanism leads to the emergence of a self-regulatory form of learning.

They define three phases of self-regulatory learning: the first is the "pre-face" phase, which includes the task and motivation orientation given to students. The second stage is the stage of self-monitoring and observation. In this case, the tasks and ideas are discussed. The third phase is the stage of "post-phase". In the end, the work done is meaningful. In fact, these phases form a cyclic unity or chain. In this process, the formation of new personality traits manifest itself as an important result. Harvey, Coulson & Mc.Maugh (2016) emphasize reflexivity in the creation of feedback mechanisms and integrative learning. They write:

Reflective practice is widely adopted across the field of experience-based learning subjects in higher education, including practicums, work-integrated learning, internships, service learning and community participation. This adoption of reflective practice implies that it supports student learning through experience. When reviewing the evidence for the role of reflection for learning, it became evident that not only was there no clear agreement about the definition of reflection, there has been little theoretical development in this area. An integrated participatory action research and ecological approach was adopted to build a theory about the ecology of reflection for learning through

experience. Through this process the assumptions, or truths that are taken for granted, that underpin the new theory were declared and substantiated (p.2).

We must also note the fact that the growing demand for active learning methods in modern times is increasing its popularity, which is more widely reflected in personality-oriented education. In personality-oriented or student-oriented education, there are more discussions, debates, group work, within this principle, the student is able to more adequately assess their knowledge and work. The feedback mechanism is the best tool in this regard for the implementation of learning activity. The feedback mechanism in student's activity should be based on a direct reflection mechanism, create a basis to self-assessment and evaluation. Learning activities such as meta-level processing of information, organization of self-regulatory system and etc. allow to achieve more effective results in creating a feedback mechanism. At the same time, the achievements in the development of cognitive activity are possible, in principle, due to the feedback mechanism. It can be concluded that in the process of development of cognitive activity, human psychological functions do not occur unsystematically, automatically, randomly. These functions are guided by a special system, purposeful attempts of the whole existence of the individual, enthusiasm and interest. Students who are able to activate its more effective aspects by properly considering their capabilities, who are able to voluntarily regulate their activities, as well as to establish the optimal work of cognition, are able to achieve success in education. Effective functioning of a number of components is required for the effective establishment of cognitive activity. Here, the joint work of the components that form the natural structure of cognition [perception, memory, thinking, imagination, will, emotions], abilities [perception, understanding, mastery, etc.], as well as personality traits formed in the process of social development is important. Therefore, when we talk about the cognitive activity of students, we are talking about the creative and dynamic development-oriented perception and application activities based on the associative relationships of these components and its productive results. The main purpose of this research is to identify the psychological mechanisms of the impact of creating feedback in learning on the student's cognitive activity.

The main hypothesis of research

The study refers to the hypothesis that the creation of feedback in learning acts as a mobilizing factor for students' cognitive activity. Feedback mechanism increases the cognitive

activity in the requirements, as well as the level of success of students, leads to the dynamic change of self-realization and provides the adequacy of self-assessment.

Research methods and methodology

Research has been conducted with the psychologist students studying in the II and III courses of Baku State University. During the study, the experimental and control groups (40 people each) established the procedures required for the study. The number of male and female students was taken equally. A total of 120 people participated in the study. In the first stage, diagnostic measurements were made, in the second stage, classes with experimental groups were conducted with the active learning methods, more attention was paid to group work. In the third stage, re-diagnostic work was conducted again, measurements were compared. The research used R. Shostrom's "Personality Orientation" (1964), "Educational Motives Survey" (2013), "Self-Assessment Scale" (1979) methods. In the research, two groups were selected to study the effect of providing feedback on learning activities on cognitive activity. Educational achievements were identified in both groups, and then the components necessary for their self-realization were diagnosed. For this purpose, the levels of self-realization, the motives that dominate the motives of self-assessment and education were analyzed. At this time, the results of selected experimental and control groups were checked. In the second stage, only the experimental group was selected. Methods such as self-realization cards, discussions, round tables creating a creative environment, etc. were used as developmental work. The aim was to determine the change dynamics of increasing cognitive activity, self-actualization and self-assertion tendencies against the background of the creation of a feedback mechanism in special conditions.

Interpretation of research results

Our correlation analysis showed a relationship between the different integrative features of the requirements and cognitive activity. Although this relationship is weak, it has a positive trend, and in comparison there are no significant differences. Here, in the experimental group, it was found that there is a correlation between learning achievements ($r = 0,29$), self-realization ($r = 0,33$), self-esteem ($r = 0,25$), learning motivation ($r = 0,35$) and cognitive activity. The same situation was observed in control group in a slightly different way. The relationship between the learning motivation and cognitive activity in each group was stable and high. Rather, with high

academic performance, to achieve the highest results and develop their potential and the desire to increase self-esteem through academic achievement are interrelated (see Table 1).

Table 1. The indicators of preliminary results in experimental and control groups

Scales	Groups (N= 120)	
	Experimental group	Control group
	Cognitive activity	Cognitive activity
Learning achievements	0,29**	0,27*
Levels of self-realization	0,33*	0,35**
Self-assessment	0,25**	0,27**
Educational motivation	0,35**	0,32*

Note: ** , * at the level of 0.05 is significant.

Table 2. The indicators of control group on different variables

Variables	Control group, N=60			
	Learning achievements	Self-assessment	Self – Realization	Educational motivation
Cognitive activity	0,168	0,612	0,154	0,69
Feedback mechanism	0,250	0,125	0,320	0,61
Creative environment	0,235	0,560	0,335	0,23

In our research the correlation relationship on each variable has shown that there are not significant differences in experimental and control groups. For this reason, the research has been conducted on several variables, in particular on the feedback mechanism and on the creative environmental factor. The indicators of control group were analyzed in Table 2. As can be seen from Table 2, there is a correlation between cognitive activity and learning activity in the range r

= 0.168, with $r = 0.612$ self-assessment, with $r = 0.154$ self-realization, and with $r = 0.69$ educational motivation, and these relationships are significant at the level of $P = 0.001$. For other variables, including the feedback mechanism and the creative environment factor, the relationships are significant at the level of $p = 0.001$. This result dictates that increasing cognitive activity makes it necessary to determine the degree of influence of other factors. Because when cognitive activity is increased, the necessary educational environment inevitably must be created and a feedback mechanism must be established in training.

Table 3. The indicators of experimental group on different variables

Variables	Experimental group, N=60			
	Learning achievements	Self-assessment	Self – realization	Educational motivation
Cognitive activity	0,165	0,536	0,178	0,62
Feedback mechanism	0,274	0,180	0,393	0,56
Creative environment	0,230	0,452	0,376	0,19

The results of the research conducted with experimental group showed that the condition before the formative work, the indicators obtained in the group don't differ significantly from control group. In Table 3, the indicators of the experimental group do not have different nuances compared to the control group for all three variables. There are also correlations and these relationships are significant at the level of $P=0.001$. After doing formative work, significant changes appeared in the experimental group compared to control group. These changes were mainly due to changes in feedback and cognitive activity on two criteria. This factor confirmed that the creation of feedback mechanism increases not only the cognitive activity, but also show itself in positive significant variables at the levels of self-realization and educational motivation. In addition, the research has shown that after formative work with the experimental group, there were changes in the components of cognitive activity, which led to significant changes in students' self-realization, learning achievements and educational motivation. These are reflected in Table 4. At the same time, research has shown that increased cognitive activity leads to an increase in

activity in education in general, strengthens creativity and values, as well as educational motivation.

Table 4. Correlation of the relationship of cognitive activity with various variables in experimental and control groups

Indicators of cognitive activity	Experimental group			Control group		
	Learning achievements	Educational motivation	Self-realization	Learning achievements	Educational motivation	Self-realization
Increased learning activity	0,732	0,610	0,870	0,766	0,022	0,096
The use of problem situations	0,885	0,283	0,205	0,480	0,160	0,276
Creativity indicators	0,430	0,795	0,625	0,089	0,420	0,069
Educational values	0,890	0,563	0,330	0,610	0,392	0,298
Empathic relationships	0,546	0,190	0,033	0,389	0,060	0,360
Flexibility of thinking	0,291	0,062	0,803	0,490	0,042	0,180
Ability to express an independent opinion	0,494	0,450	0,480	0,402	0,203	0,006

As a result, we can say that increasing cognitive activity in students and creating the feedback mechanism creates a basis for realization the potential goals, as well as increasing the level of different components. It should be considered that cognitive activity is directly related not only to the creation of a feedback mechanism, but also to the characteristics of educational motivation and the system of individual qualities and values. Thus, we can say that the main indicators of feedback are characterized by increased learning achievement, increased cognitive activity and systematization of self-realization trends. By creating a special educational environment, it is possible to provide a feedback mechanism and thus increase self-esteem, self-realization, teaching

planning and propensity for creativity. Taking these factors into account can enhance the academic achievement of the requirements and stimulate their self-realization motives.

Discussion and conclusions

This research has shown that the creation of feedback in learning is a mobilizing factor for students' cognitive activity, and this can be empirically proven. Creating such a relationship in training can only be done against the background of cognitive activity. This research has shown that only the provision of cognitive activity increases students' self-assessment, and the means of self-expression are focused on the result, not the goal. Also, the creation of a favorable educational environment provides a feedback mechanism, feedback mechanism can be created through specially organized methods and formative work.

The results of this research on increasing cognitive activity in students and the creation of feedback mechanisms indirectly coincide with the results of many studies, though not directly. (Brindley & Scoffield, 1998; Bloomberg, 1972; Topping et al., 2000). These studies have found that feedback prevents the assessment of wrong knowledge, facilitates generalization, identifies missing knowledge, and prevents deviations from the ideal. At the same time, our research has shown that cognitive activity is directly related not only to the creation of feedback mechanisms, but also to the characteristics of educational motivation, levels of self-realization, adequacy of self-assessment, a system of values and individual qualities. Thus, we can say that the main indicators of feedback are characterized by increased learning achievement, increased cognitive activity and systematization of self-realization trends. By creating a special educational environment, it is possible to provide a feedback mechanism and thus, increase self-esteem, self-realization, teaching planning and propensity for creativity.

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